

## A New Species of the Genus *Lebbeus* (Caridea: Hippolytidae) from the Northeastern Pacific

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*Abstract.*—A new shrimp, *Lebbeus catalepsis*, is described. Found very low in the intertidal zone in rocky, high energy areas in the Strait of Juan de Fuca, it is closely related to *Lebbeus lagunae* (Schmitt) recorded from California. Notes on color, habitat, and behavior are included.

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Shrimps of the genus *Lebbeus* (White 1847) are small to medium sized species occurring primarily in temperate or arctic regions of the north Pacific and north Atlantic oceans. Recent taxonomic works dealing with this genus include Wicksten (1978), Butler (1980), and Wicksten and Mendez (1982).

Collections made in the low intertidal in the Strait of Juan de Fuca revealed the presence of an undescribed species of *Lebbeus*, the first member of this genus to be recorded intertidally in the Pacific northwest.

### *Lebbeus catalepsis*, new species

Figs. 1, 2A-F, 3A-G

*Type material.*—Holotype male, carapace length 4.1 mm. Strait of Juan de Fuca, between Sekiu and Neah Bay, Washington (48°19'N, 124°28'W); low (-0.3 m) intertidal, 23 December 1984, Gregory C. Jensen, collector. National Museum of Natural History, Smithsonian Institution, USNM no. 228141. Also allotype, ovigerous, carapace length 4.2 mm, same location and date, USNM no. 228142. Seven paratypes each deposited at the U.S. National Museum of Natural History (USNM 228143; 228144), California Academy of Sciences (CAS 060416-060418), and British Columbia Provincial Museum (BCPM 985-530-1; 985-531-1). Transparencies of common color morphs deposited with paratypes.

*Description.*—Integument thick, surface smooth; plumose setae on carapace and abdomen, much more numerous in males. Rostrum extremely reduced, composed of a short, sharp spine less than 0.1 carapace length. Carapace with 2-3 curved dorsal spines in males, 3-4 in females. Supraorbital spines extremely large; sub-orbital lobe bluntly pointed in dorsal view. Antennal and pterygostomial spines strong, sharp.

Abdominal somites lacking carinae; dorsal surface of second abdominal somite with deep transverse sulcus. Pleura of first four abdominal somites of female somewhat rounded; males generally more angular but not sharply pointed. Pleuron of abdominal somite 6 strongly produced posteriorly in both sexes. Pleura of abdominal somites 1-6 tipped with clusters of plumose setae, increasing in number and size from anterior to posterior somites and more developed in males. Sixth abdominal somite with large posteroventral spine; ventral surface with median process tipped with spines and plumose setae. Telson 1.2-1.5 times longer than

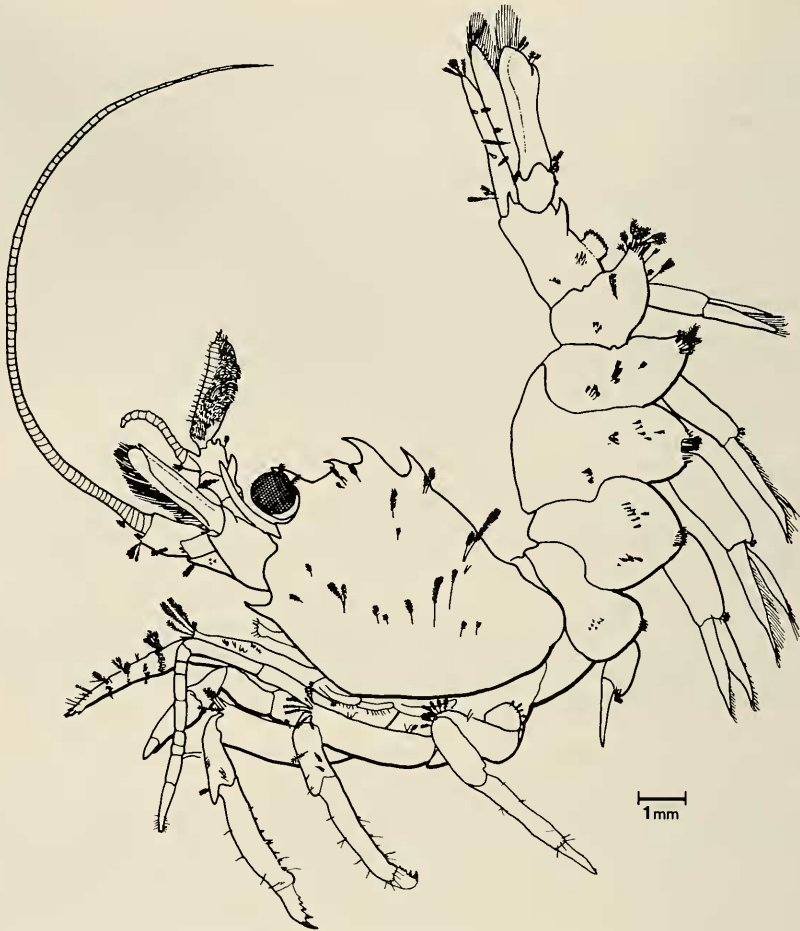


Fig. 1. *Lebbeus catalepsis*, male holotype.

6th abdominal somite; armed with two pairs of dorsolateral spines. Tip of telson with two pairs of stout, terminal spines and produced into a blunt spinous process mesially; three pairs of plumose setae between spines and mesial lobe, inner pair longest.

Eye large, with pigmented, faceted cornea; eyestalk with dorsal plumose setae.

Basal article of antennular peduncle with small ventromesial spine. Stylocerite somewhat blunt, curved dorsally, and reaching third article of the antennular peduncle. Article 2 wider than long, with strong dorsolateral spine; article 3 with small distal dorsal spine, sometimes obsolescent. Dorsolateral flagellum proximally composed of 20–22 thickened segments; ventral margin with extremely thick, plush assemblage of aesthetascs. Distal portion minute, slender, with only 3–4 segments. Ventromesial flagellum shorter, slender; composed of 11–18 segments.

Basicerite of antenna large, armed with strong ventrolateral and dorsolateral teeth; carpcerite exceeding middle of antennal scale and with distal plumose setae. Antennal scale about twice as long as wide in females and more than 2.9

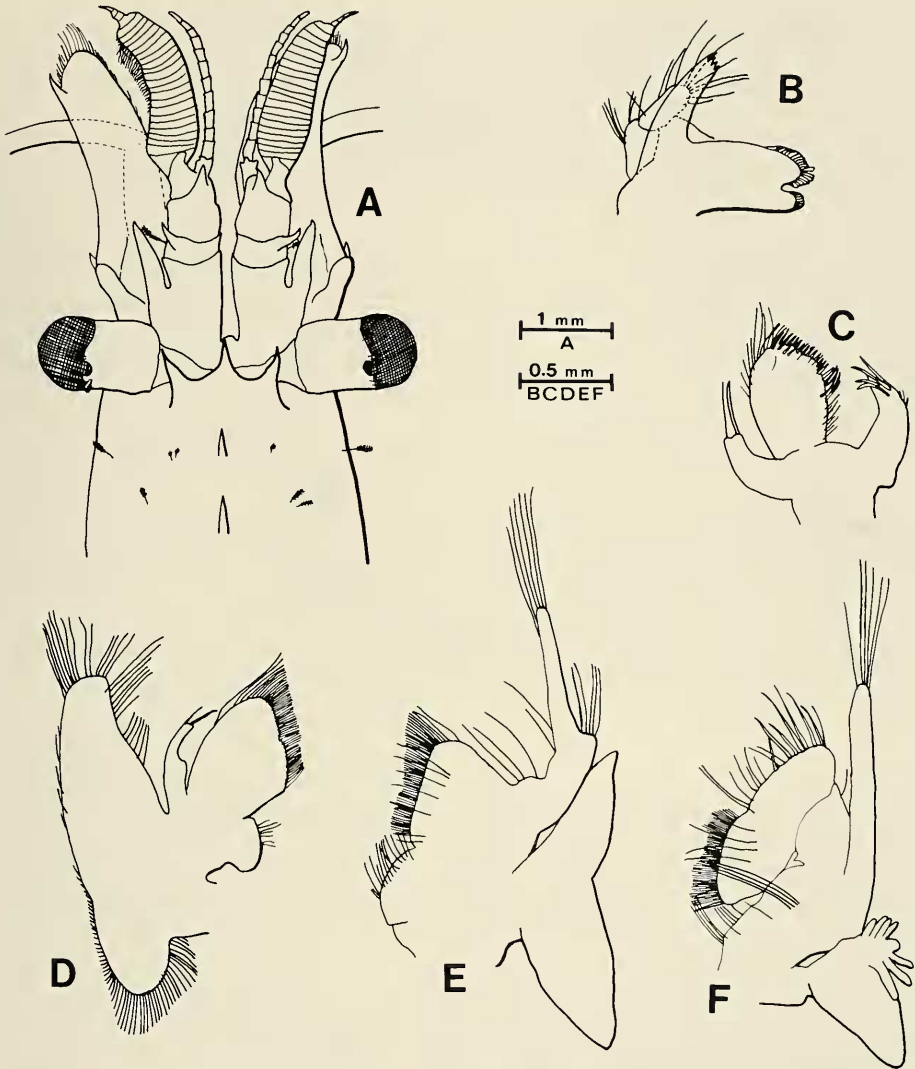


Fig. 2. *Lebbeus catalepsis*, male paratype: A, frontal region in dorsal view; B, mandible; C, first maxilla; D, second maxilla; E, first maxilliped; F, second maxilliped.

times in males; outer margin very concave in males, only slightly in females. Tip of spine curved mesially, not exceeding lamella. Flagellum slender, about equal total body length.

Mandibles with two segmented palp and slender incisor with 4 distal teeth; molar large, subcylindrical, and armed with denticles.

First maxilla with palp bearing 2 long setae, inner much thicker than outer. Proximal endite slender, tipped with long setae. Distal endite broad, suboval; long setae scattered distally and many short spines along mesial margin.

Second maxilla with palp tipped by 2 long setae. Basal endite entire with slight median notch, densely setose; coxal endite small with few setae. Anterior lobe of

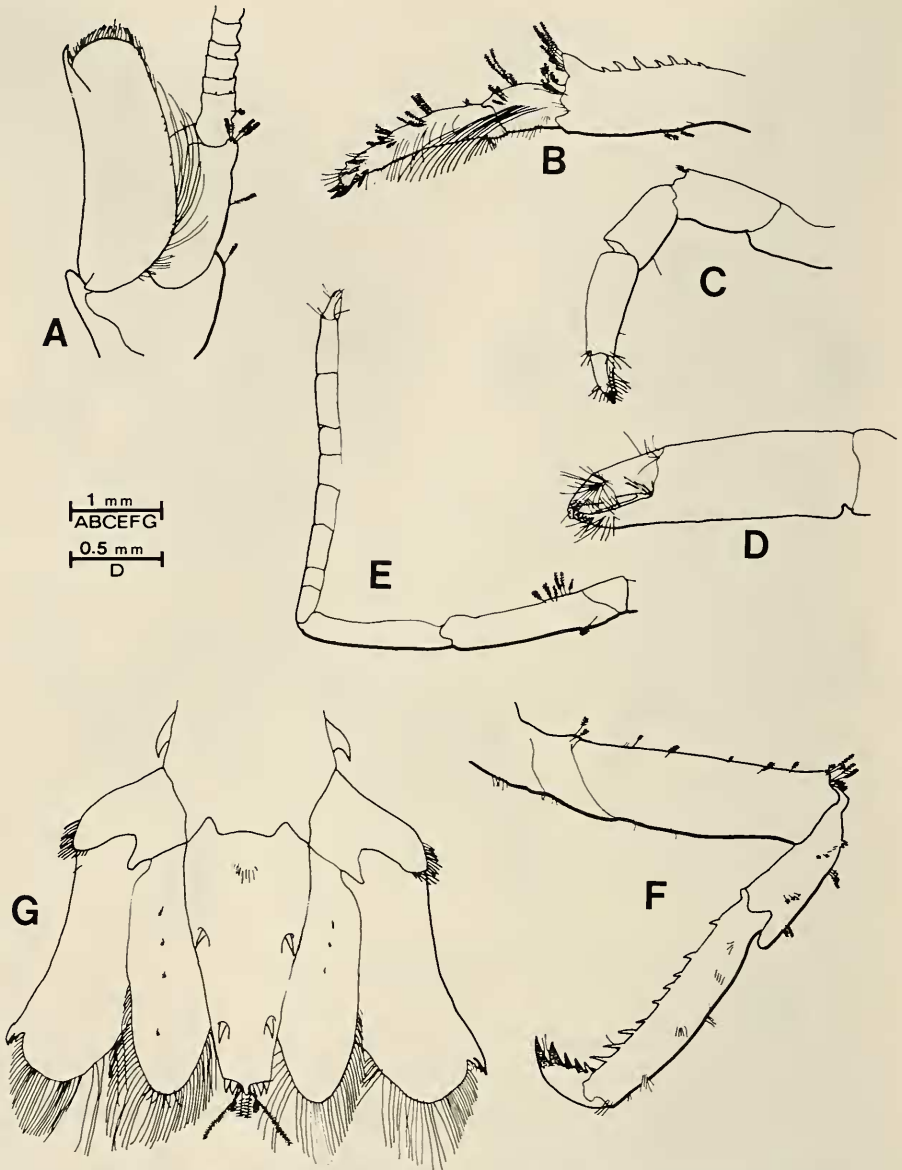


Fig. 3. *Lebbeus catalepsis*, male paratype: A, antennal scale; B, third maxilliped; C, first pereopod; D, chela of first pereopod; E, second pereopod; F, third pereopod; G, dorsal view of telson and uropods.

scaphognathite long, narrow, anterior and mesial margins with long setae; short setae along lateral margin; posterior lobe rounded, with long setae.

First maxilliped with large basal endite, densely setose on mesial margin. Exopod well developed, tipped with long setae; proximal lobe with long setae. Epipod large, bilobed.

Second maxilliped armed with dense spines and setae mesially. Exopod well developed, tipped with long setae. Epipod with small distal podobranch.

Third maxilliped stout; dorsal surface with clusters of plumose setae. Ultimate

article tipped with 6 strong, corneous spines. Penultimate article about twice as long as wide; antepenultimate article with dorsal spines. Coxa with epipod.

First pereopods chelate, equal in length. Dactyl corneous, 0.35–0.6 length of palm; palm about 2.2 times longer than wide. Carpus 1.4–1.7 times longer than wide; merus with length about 2.4 times greater than width. Coxa with epipod.

Second pereopods long, slender, chelate. Dactyl 0.6 or less length of palm; palm about 3.75 times longer than wide. Merus 5–6 times longer than wide and 0.6 length of carpus; coxa with epipod.

Third pereopods very stout; dactyls bifid, preceded by three corneous spines on flexor margin. Propodus with 13–16 spines on flexor margin, increasing in size distally and with last 3 or 4 in pairs; extensor margin with plumose setae. Carpus shorter than propodus, with some tufts of plumose setae. Merus 3.5–4.0 times longer than wide, with large cluster of plumose setae on dorsal, distal margin; coxa with epipod.

Fourth and fifth pereopods similar to third but decreasing in size and lacking epipods.

Pleopods of females normal, with exopods slightly longer than endopods. First pleopod of male with bifid endopod; inner lobe tipped with hook-like setae and exceeding outer lobe. Second pleopod of male with large, stout appendix masculina, 0.8 length of appendix interna and tipped by many long spinules.

Uropods equal in length, slightly exceeding telson; exopods with concave outer margins ending in a large lateral spine and small inner spine. Basal section of uropods blunt, tipped with setae.

Eggs nearly round, about  $0.52 \times 0.56$  mm.

Total body length to 20 mm.

*Color.*—Male *Lebbeus catalepsis* are frequently transparent with a greenish-yellow cast; some blotches of brown, orange, pink, or white may also be present. The legs and antennae are generally banded with brown. Females are extremely variable, ranging from olive brown to a bright pinkish purple matching coralline algae common in their habitat. The carapace and abdomen may be either a solid color or mottled, or may be a combination of colors and transparent areas. There is usually a white or transparent “saddle” near the cardiac region and extending through the first or first and second abdominal somites. The third maxilliped is a bright white, starting with the distal half of the antepenultimate article and often extending to the tip of the maxilliped.

The pleura of female specimens are usually strongly pigmented, rather than transparent as in the males. This coloration may serve to camouflage developing embryos, as suggested for other hippolytid shrimp (Bauer 1981).

*Remarks.*—*Lebbeus catalepsis* is found in the low intertidal zone (–30 cm) in rocky, wave-washed areas of the Strait of Juan de Fuca. Specimens were captured by scraping the sides and edges of large rocks with a fine-meshed net, and were most frequently encountered in channels lying parallel to the water’s edge. The species was easily distinguished in the field by its defensive “cataleptic” position (Butler 1980), not commonly observed in other intertidal species in the region. Other species of hippolytids taken in the same area included *Heptacarpus carinatus*, *H. brevisrostris*, *H. stylus*, *H. pugettensis*, and *Spirontocaris prionota*.

Captive animals rarely move and cling tightly to any available substrate, probably an adaptation to the high energy environments in which they are found. They

react strongly to the approach of another individual and repeatedly strike them with rapid movements of the second antennae; this results in the immediate departure of the other shrimp.

*Etymology.* — The specific name is in reference to the cataleptic position. This is a defensive position assumed by some species of shrimp in which the abdomen is raised, bringing the telson near the head (Butler 1980). Specimens of *Lebbeus catalepsis* kept alive in captivity for over six months were never observed to change from this position.

*Systematics.* — The extremely short rostrum, composed of a simple spine, easily distinguishes *Lebbeus catalepsis* from all other species of *Lebbeus* in the Pacific northwest. *Lebbeus catalepsis* is closely related to a southern California species, *L. lagunae* (Schmitt), recorded from Pacific Grove to Punta Banda, Baja California (Wicksten 1982). *L. catalepsis* lacks the large, decurved spines below the articular knobs on the posterolateral margin of the fourth and fifth abdominal somites of *L. lagunae*. The telson of *L. catalepsis* bears only two pairs of dorsal spines, compared to three pairs in *L. lagunae*. In addition, the stylocerite of *L. catalepsis* reaches the third article of the antennular peduncle, while in *L. lagunae* it rarely exceeds the first article. Females of the two species also differ in the pleuron of the second abdominal somite. In female *L. lagunae* the lower anterolateral margin is concave and preceded by a thick patch of setae; the surface of the pleuron bears many dense patches of setae. In female *L. catalepsis* the anterolateral margin is convex, lacks setae, and the lateral surface of the pleuron has only one patch of setae.

Wicksten (1978) observed a live *L. lagunae* and noted that it kept the abdomen elevated above the substrate; the shrimp was very well camouflaged and caught amongst algae. Thus, strong similarities between the two species may be behavioral as well as morphological.

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